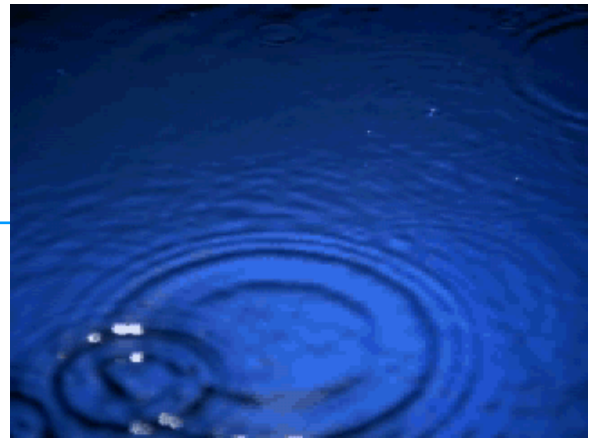
Global Precipitation Measurement

System Requirements Review
Mission Overview



June 4 - 5, 2002

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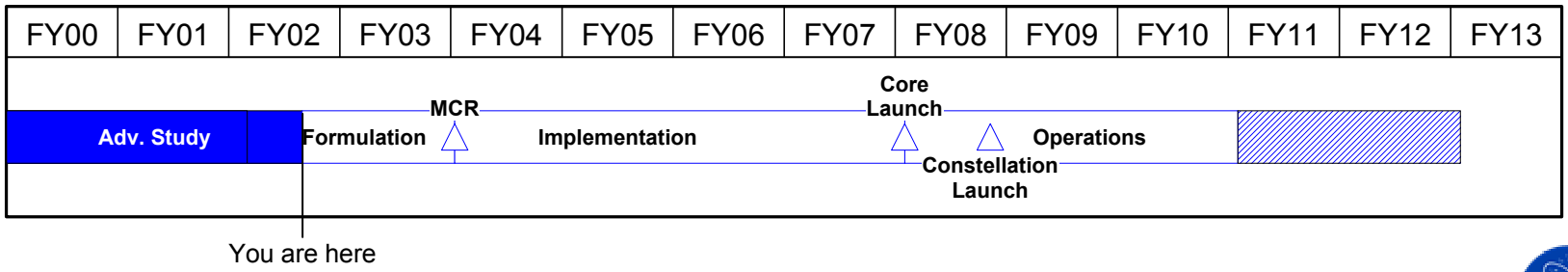
History

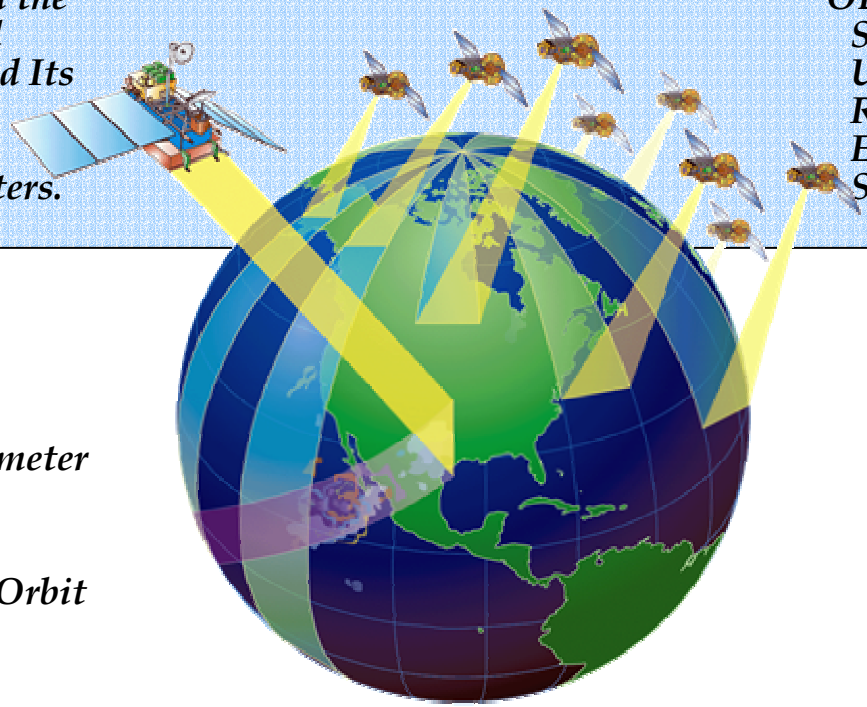
- ***EOS-9 Endorsed at EOS Planning Workshop, 1998***
- ***Design Center Studies, 1999-2001***
  - *2 IMDC Sessions*
  - *2 ISAL Runs*
  - *1 Team X Study*
  - *4 RSDO Studies*
  - *1 Core In-House Feasibility Study*
- ***FY01 Advanced Study***
  - *Examined Options for All Elements*
  - *Refined Recommended Approach*
- ***FY02 Begin Formulation***
  - *Partnerships*
  - *Programmatics and Management Planning*
  - *System Requirements Definition*



GPM Feb '01 Reference Concept

OBJECTIVE: Understand the Horizontal and Vertical Structure of Rainfall and Its Microphysical Element. Provide Training for Constellation Radiometers.

OBJECTIVE: Provide Enough Sampling to Reduce Uncertainty in Short-term Rainfall Accumulations. Extend Scientific and Societal Applications.



Primary Satellite

- *Dual Frequency Radar*
- *Multi-frequency Radiometer*
- *H2-A Launch*
- *TRMM-like Spacecraft*
- *Non-Sun Synchronous Orbit*
- *~65° Inclination*
- *~400 km Altitude*
- *~4 km Horizontal Resolution*
- *250 m Vertical Resolution*

Constellation Satellites

- *Multiple Satellites with Microwave Radiometers*
- *Sampling Sufficient to Resolve the Diurnal Cycle*
- *Sun-Synchronous Polar Orbits*
- *~600 km Altitude*

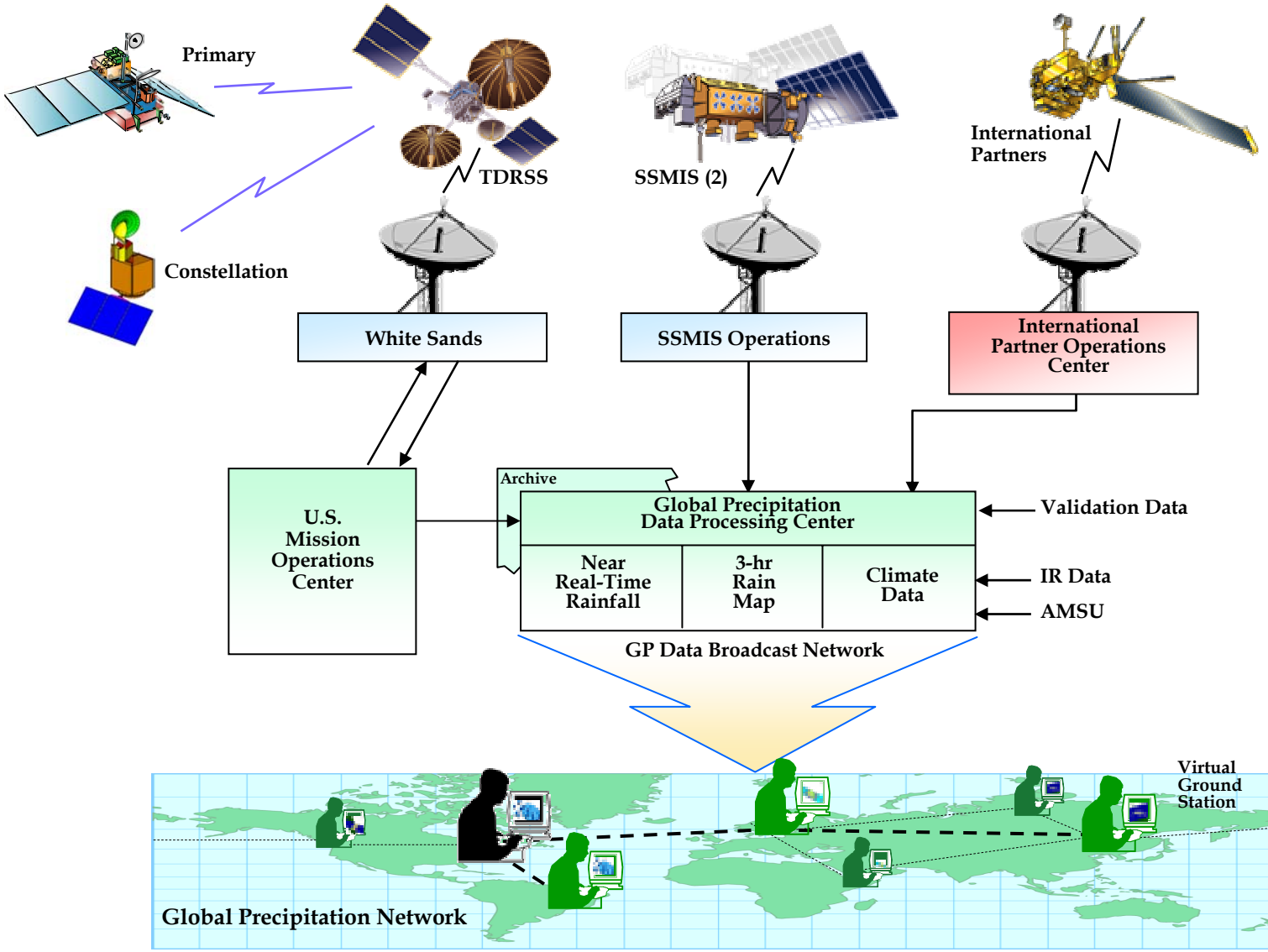
Precipitation Validation Sites

- *Ground Truth and Calibration*
- *Cooperative International Research*

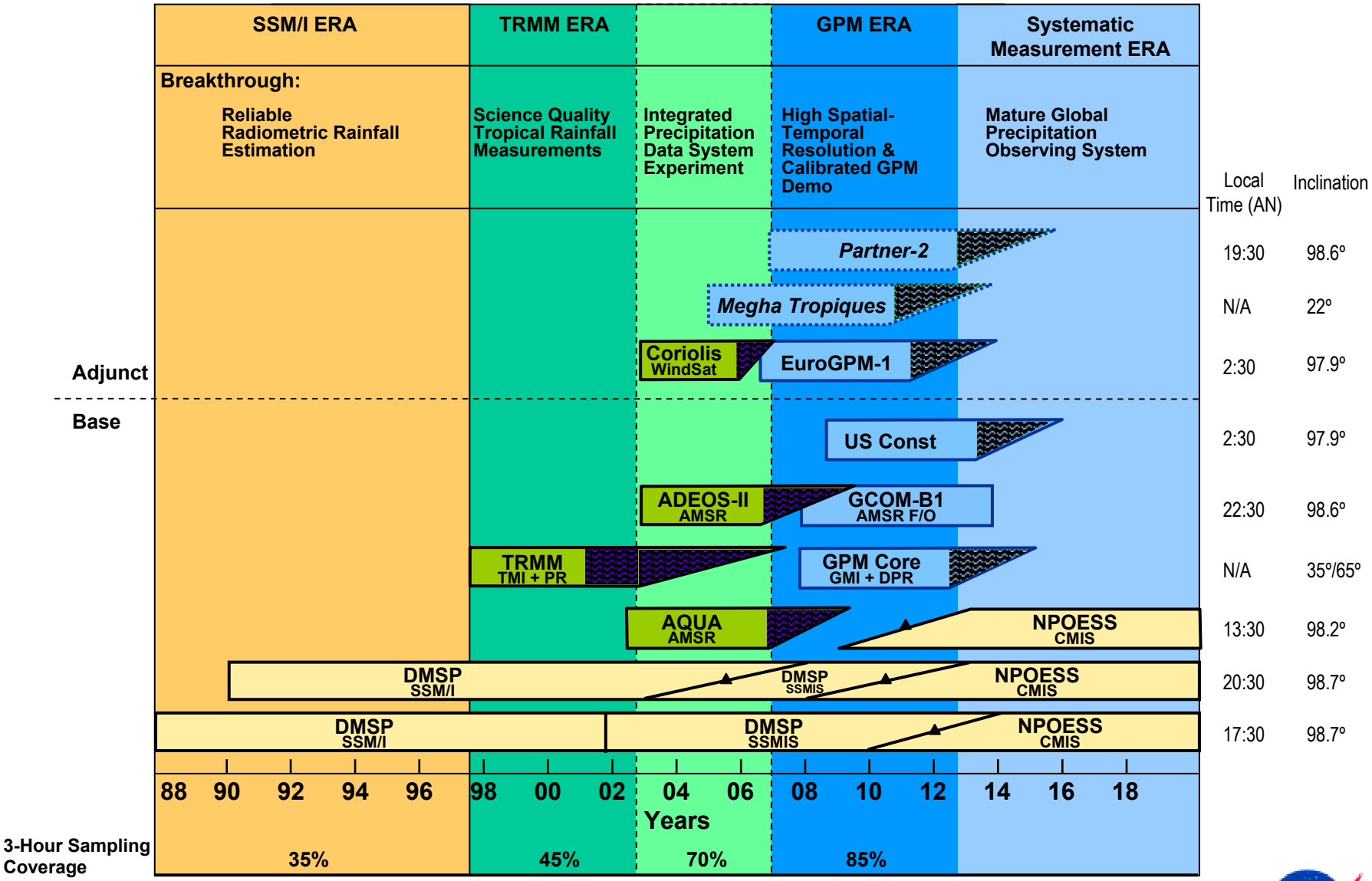
Global Precipitation Processing System

- *Capable of Producing Global Precipitation Data Products from Diverse Sensors and Sources*
- *Cooperative International Partnerships*

Mission Overview

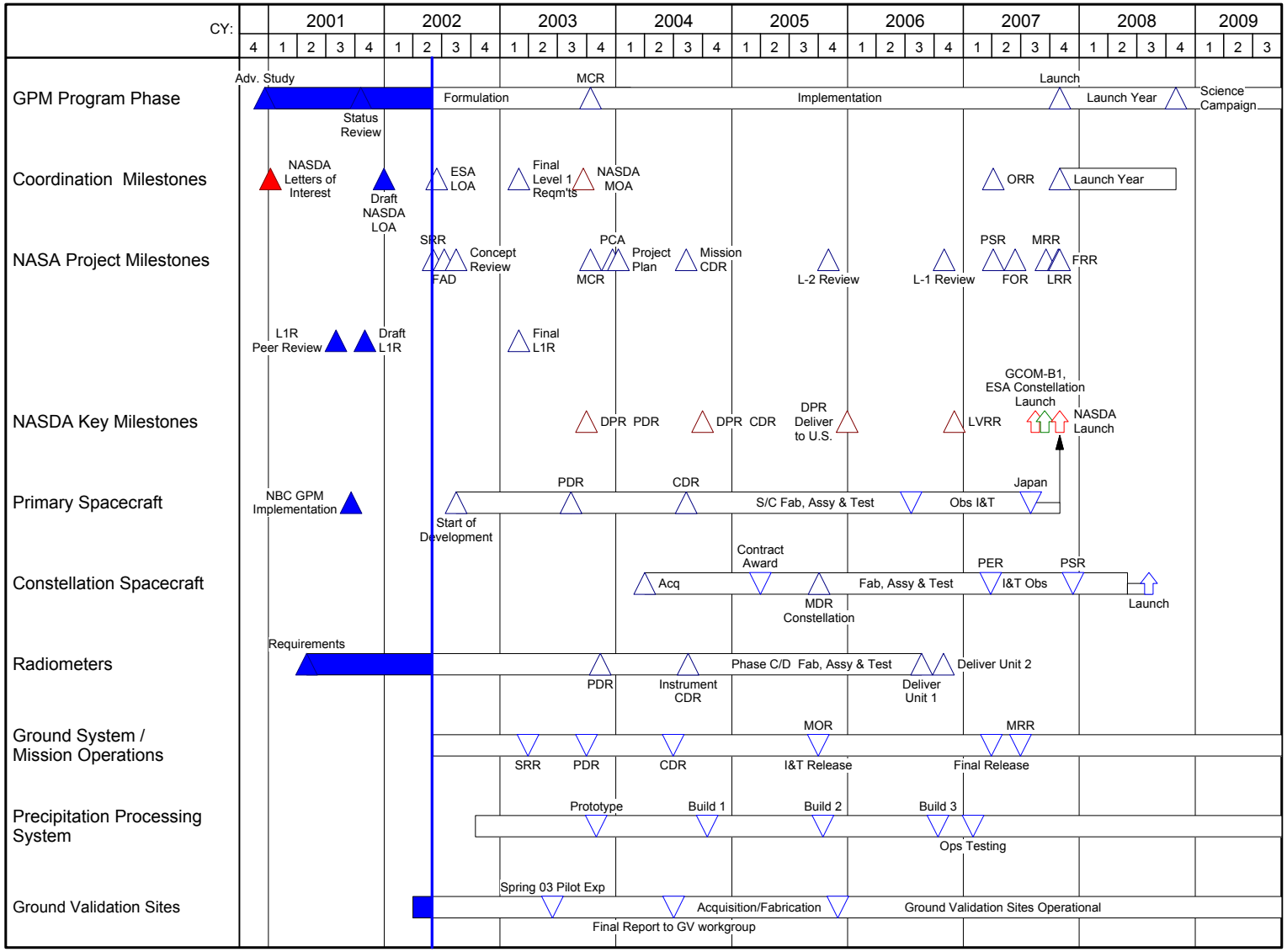


Constellation Build-Up



Master Schedule

5/31/02



Principle Risk Mitigation

- ***International Partnerships***
  - *Japan critical to mission success*
    - *Follows same model as TRMM*
  - *Data streams*
    - *No hardware exchange planned*
    - *Base mission requires only NASA and IPO data streams*

- ***Science Data Processing Multiple Asynchronous Data Streams from Diverse Sensors***
  - *Evolve from TSDIS design*
  - *SEEDS/IPDS/PPS accelerated implementation retires GPM risk early*
  - *Trial runs with*
    - *AMSR*
    - *Megha-Tropiques*
    - *Coriolis (possible)*

Miscellania

- ***Names***
  - *Core = Primary spacecraft*

- ***Core Spacecraft Mass Allocation In-Flux***
  - *NASA currently using 3200 kg, NASDA recent update of H-IIA 3000 kg*
  - *Solutions Exist*

- ***Calibration and Error Characterization (Ground Instrumentation)***
  - *Approach needs better definition before preliminary design starts*
  - *Not significant on space segments*
  - *Science Working Group established*
  - *Field experiments planned*